Center for Semiconductor Modeling of Materials and Devices (CSM)

S&T Campaign: Materials Research
Photonics
Imaging Sensors & Optics

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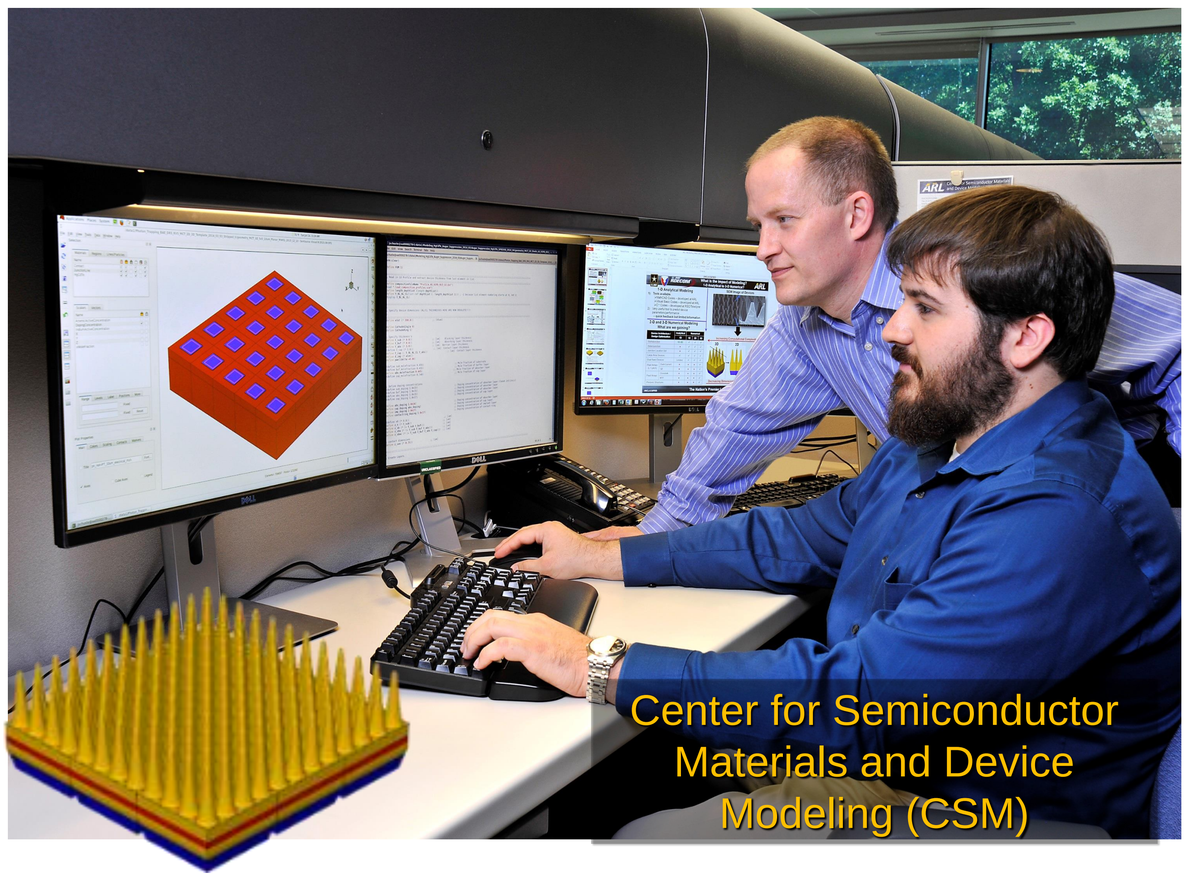
Research Objective

The US Army's future operating concept will rely heavily on sensors, nano-electronics, and photonics technologies to rapidly develop situational understanding in challenging and complex environments. To meet this challenge, ARL has identified a strategic need to foster and accelerate collaborative research related to the modeling of advanced electro-optic semiconductor materials and devices. The CSM will act as a repository of a broad base of modeling knowledge to be shared across the community in order to foster the development of new materials as well as to reduce the timeline between "discovery" and manufacturing.

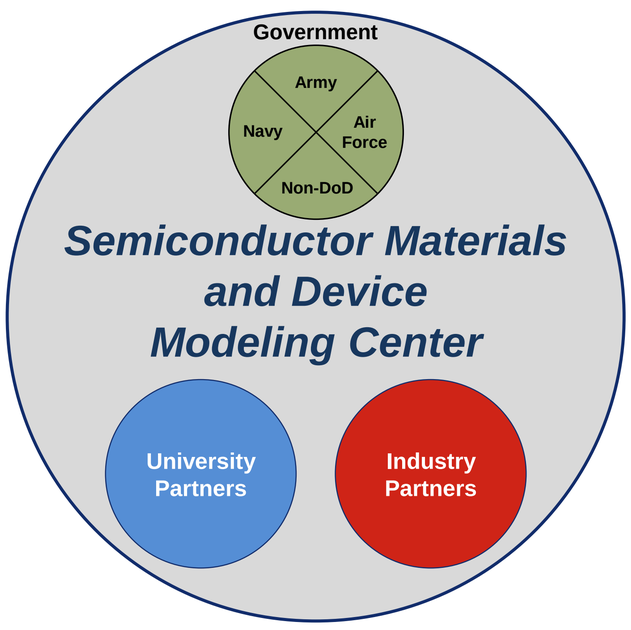


Participants

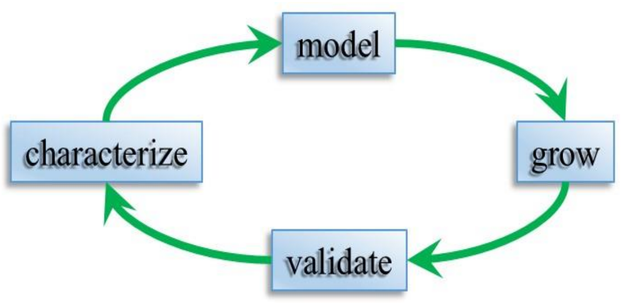
Open to national and defense labs, universities, and industry

Concept of Operation

The CSM will establish an overarching cooperative research and development agreement that defines the extent of collaboration conducted under the center and defines the disposition of Intellectual property and the sharing of research outcomes and laboratory resources.



Every Partner is Value Added to The Center



- **Start with HgCdTe**
- **Expand into other IR materials**
- **Broaden scope to other material systems**

Collaborative focus

- **New multi-scale modeling from atomistic to device scales**
- **Validation coupled to the advanced modeling**
- **Pooling of computational tools and resources**
- **Emitter and Detector semiconductor materials**

Benefits

- **Ability to leverage ARL's Enterprise for Multiscale Research of Materials**
- **Access to ARL's existing EO expertise.**
- **Increased product yields and lower cost**
- **Advancing the state-of-the-art in modeling and materials sciences**
- **Procurement and deployment with confidence and minimal risk**
- **Awareness of important DoD needs**
- **Exposure to new ideas and collaborators**

Unique facilities

- **ARL's High Performance Computing Center**
- **Class 100/10 Cleanroom**
- **ARL's characterization, processing, and fabrication facilities external to the cleanroom**